



Hospitals evolve at a killing pace

A conversation with Arnold Sikkel

The Erasmus Medical Center, the Jeroen Bosch Hospital, the University Medical Center Utrecht, the Radboud University Medical Center, the KSSHP Hospital in Finland. This is just a small sample from the impressive list of projects that EGM has worked on. We were given the opportunity to interview one of the partners of the architectural firm, Arnold Sikkel, who was chairman between 2004 and 2013 and is currently responsible for communication and acquisition. In an hour-long conversation he offered an insight into the baroque exercise that is designing a hospital or as Sikkel put it: "These buildings really encompass all scale levels: urbanism, landscape, building physics, interior design, supply management, the list goes on and on. Hospitals are fairly complex buildings." Text: Bas Turk & Rik de Bondt

EGM is located near the Oude Maas river in Dordrecht, South-Holland. The endless stream of boats sailing by make up a beautiful scenery for the building. A pool table and dartboard in the canteen provide a relaxed atmosphere. The roof window above the atrium offers an intriguing view to the top of the railway bridge less than a hundred meters away. Merel Brabers, a TU Eindhoven graduate who just started working at the firm's Research and Development department, introduces us to Arnold Sikkel, who has been designing hospitals since before we were born. Sikkel graduated as an architect at the TU Eindhoven in the nineteen eighties. His graduation teacher was Wout Eijkelenboom, the *E* in *EGM*. Sikkel started working at EGM in 1985.

Harmonica

Design briefs for hospital buildings are big, containing extensive descriptions of about four to six thousand rooms. Obviously, these rooms cannot be regarded as separate parts; they are integral components of the building in the same way organs are part of a body. The parts have to be structured as economically and technically efficient as possible, meanwhile facilitating a convenient place for doctors and nurses to work pleasantly and for patients to heal quickly.

"Organization models of hospitals evolve at a killing pace; a newly delivered building is always based on an organization model from a couple of years ago, and hence, by the time of its opening, already is obsolete in multiple aspects," Sikkel observes. He therefore lists three keywords that are essential in hospital design: flexibility, adaptability and expandability. Healthcare has become increasingly demand-driven, whereas before a doctor just had a limited amount of beds, now the different wards have to be able to adapt to fluctuations in demand. "In order to accommodate these fluctuations, a hospital has to be like a harmonica: expanding, shrinking and transforming without severe structural adjustments."

Much of this adaptability depends on the basic type of the building. Equipment, personnel and patients should be conveniently exchangeable throughout the building. A hospital is a big structure of networks. Sikkel prefers the comb structure as a basic type, which is also present in the Delft hospital which EGM designed. The comb structure allows for the organization of the departments along one axis, so as to avoid too much traffic in the wards. The comb structure is a horizontal type; exchanging goods and people horizontally can be done quicker

than vertically. Even though a horizontal hospital building takes up more land, and therefore is more expensive to build, a horizontal building can be more cost-effective than a vertical building, depending on personnel costs and land prices. EGM is also involved in a project in Indonesia. As land is more expensive there, EGM has to design a more vertical building type.

Logical whole

Radiotherapy departments have rooms where the floors, ceilings and walls have to be made out of three meters of concrete, to block harmful radiation. Due to such technical requirements this department is positioned early in the design process. Sikkel sketches the struggle of arranging the departments: "The problem with designing hospitals is that its users seem to expect to get a Belgian bus; they all want to sit near the front window." Clearly, some kind of order is necessary to make the building a logical whole. This order is established by an acute axis through which the intensive care, emergency room and operation rooms are connected. All the other components are placed around this axis.

As an architect it is essential to empathize with clients and understand the problems they pose, Sikkel thinks. "I am not a doctor, but I do understand what those people do and I can talk about it with them. I have to discuss with doctors about how they are going to work and as an architect I am expected to suggest improvements in their working process. Sometimes doctors suggest improvements themselves and then we do feasibility studies."

The way in which patients are welcomed in the hospital and the way doctors and medical professionals work changes fast. This is caused by new technologies that appear in the hospital, large and small. A small technology, like text messaging on cellphones, has a big influence as it allows to discuss whether physical presence at the clinic is really necessary for each appointment with a doctor. Furthermore, big technological developments like big data may well change the whole process of diagnosing illnesses. When a new technology makes an entry, it has to be easy to implement it in the building. To increase flexibility, the nursing wards and polyclinics have, up to a certain extent, the same arrangement. EGM chose a standardized room, based on a standardized structural grid, and has investigated that a room of eighteen square meters is big enough to accommodate all different kinds of research, with the remarkable exception of the gynecol-



ogy polyclinic. A gynecologist traditionally works in a circle around which all the equipment is situated and therefore needs a larger area. The layout model EGM used in Curaçao, with service axes and double corridors, allows making a polyclinic on the same structural grid and with the same technical services as a ward.

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Evidence-based design

Research shows that a well-designed environment can support and accelerate healing processes. EGM developed an evidence-based design tool to help architects and healthcare organizations with making more well-founded decisions during the design process. Traditionally, EGM's architects and their clients make design choices intuitively, based on their experiences. Evidence-based design is a method that is aimed at basing design choices on scientifically underpinned effects of the spatial environment on the experience and well-being of patients and other users. However, this does not mean that architects and their clients are bound to research results as absolute truths, as these results will always have to be critically interpreted and assessed.

Evidence-based design is founded mostly on the methods of evidence-based medicine. Much of the research in environmental psychology is carried out in the United States. EGM works together with multiple Dutch research institutions, among which Fontys,

research institute Nivel and Delft University of Technology to expand their knowledge. The tool EGM developed is basically an online archive in which research results are collected and ranked on their significance. The tool is used for designing organization, light, sound and climate properties of buildings. The tool is supportive in starting conversations between architects and medics.

When patients are in a severely bad or unstable condition, they will be put under intensive care and monitored twenty-four hours a day. The intense activity and haste on these intensive care wards sometimes causes delirium with patients, which is bad for the patient's healing process. "With acoustic materials, noise can be significantly reduced around the individual patients, offering them a more stable environment and thereby probably speeding up their healing process," Sikkel states. Moreover, research has pointed out that supporting the patient's natural biorhythm, even if he is sleeping most of the day, accelerates his recovery. Based on this kind of findings, strong arguments can be made for providing intensive care wards with windows, even if the investment would be more costly.

EGM is actively building up databases with pre- and post-evaluations of their own projects to complement the scientific research that is collected in their evidence-based design tool. When a new design is made, first the old situation is carefully documented and measured in order to compare it to the newly designed situation. That way the designers can evaluate whether the project has yielded the desired effects.

International

EGM is involved in multiple projects abroad. In cooperation with a local office, EGM is working on an academic hospital in Finland. "In this cooperation, it is not self-evident to the involved local parties to employ our knowledge and experience for this project. Often these local parties prefer to experiment



and do their own thing, and make their own mistakes reinventing the wheel." Confronted with many foreign examples, Sikkel is able to regard Dutch hospitals within an international frame of reference. "The Dutch find daylight entry essential for good working spaces, while in America fully enclosed work spaces can still be encountered. The best part about working abroad is to implement a hospital into the local culture," says Sikkel. "In collaboration with OeverZaaijerLyongo from Amsterdam, I have worked on a hospital Curaçao and later I have worked on the design for a hospital in Paramaribo. Here in the Netherlands, we sometimes think that those cultures are similar, but they are completely different. In Curaçao, for example, coldness is regarded as the biggest luxury one can have. When entering a building there, while the outside temperature varies between thirty and thirty-six degrees Celsius, I would sometimes need a coat to bridge the temperature difference." So EGM gave Curaçao a completely air conditioned building. In Paramaribo on the other hand, EGM realized nursing wards with blind windows, allowing only wind to enter and naturally ventilate the building. "From a hygienic point of view, the solution in Suriname is much more appealing than the one in Curaçao. Nevertheless, both in Suriname and Curaçao the concerned parties think the chosen approach is self-evident," Sikkel observes, amused. "Colleagues of mine work in the Middle East, where male and

female wards have to be strictly separated. However, the medical equipment needs to be accessible for both zones. This results in different solutions for the structure of the hospital, which is what makes designing a lot of fun."

"An architect is no longer a jack-of-all-trades.

A similarity between Suriname and Curaçao however, manifests itself in a problem not yet obviously present in the Netherlands, namely obesity. There are indeed cases of severe obesity in the Netherlands, but in these transatlantic countries a significant part of the population differs in weight between 250 and 600 kg per person. This has a serious impact on the architectural design, from elevators and toilets to the concentrated load on the floor caused by the weight of an obese patient on an operation table. Besides, obesity has effect on the people that work with these patients. Nursing or carrying such patients cannot be done alone. Since this is likely to be occurring more frequently in the Netherlands sooner or later, this problem already has to be anticipated on now.

Professions in transition

Sikkel is witnessing the transition of the hospital from the doctor's domain to a multi-disciplinary health platform, partly thanks to developments in big data technology. Philips Healthcare, for example, has expanded from designing machines to getting involved in a wide range of software appliances for hospitals. Likewise, the discipline of architecture has changed a lot in the last decade, and should continue to change in the future, according to Sikkel. "It is important to share our knowledge with other disciplines. One who cannot share, cannot multiply. We can only make improvements if we exchange views with people from other disciplines, who can give us new insights from their field of expertise. An architect is no longer a jack-of-all-trades, which is why young architects and engineers should develop themselves in cooperating with other disciplines. Please take that as an advice."

Images: 1. Atrium at the EGM office with view over railway bridge (photo: Rik de Bondt) 2. Arnold Sikkel (photo: Rik de Bondt) 3. Polyclinic and day treatment department in the Curaçao hospital (courtesy of EGM architecten)



Sources: 1. Interview with Merel Brabers and Arnold Sikkel at the EGM office on October 17, 2016

